

Form 3160-3  
(April 2004)UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

## APPLICATION FOR PERMIT TO DRILL OR REENTER


FORM APPROVED  
OMB No 1004-0137  
Expires March 31, 2007

1a Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5 Lease Serial No. <b>NMLC-028793A</b>
1b Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6 If Indian, Allottee or Tribe Name N/A
2 Name of Operator <b>COG Operating LLC</b>		7 If Unit or CA Agreement, Name and No <b>NMNM-88525X; Burch Keely Unit</b> [808086]
3a Address <b>550 W. Texas Ave., Suite 1300 Midland, TX 79701</b>		8 Lease Name and Well No. <b>BURCH KEELY UNIT #643</b>
3b Phone No. (include area code) <b>432-685-4384</b>		9 API Well No. <b>30-015- 359403957D</b>
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface <b>2120' FNL &amp; 2310' FWL, Unit F</b> At proposed prod. zone		10 Field and Pool, or Exploratory <b>Grayburg Jackson; SR-Q-Grbg-SA</b> [28509]
11 Sec, T R. M. or Blk. and Survey or Area <b>Sec 19 T17S R30E</b>		12 County or Parish <b>EDDY</b>
13 State <b>NM</b>		14 Distance in miles and direction from nearest town or post office* <b>2 miles from Loco Hills, NM</b>
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig. unit line, if any) <b>2120'</b>	16 No of acres in lease <b>629.65</b>	17 Spacing Unit dedicated to this well <b>40</b>
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft <b>250'</b>	19 Proposed Depth <b>4800'</b>	20 BLM/BIA Bond No. on file <b>NMB000740; NMB000215</b>
21 Elevations (Show whether DF, KDB, RT, GL, etc.) <b>3626' GL</b>	22 Approximate date work will start* <b>10/30/2011</b>	23 Estimated duration <b>15 days</b>

## 24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form.

- |  |   |
|--|---|
| 1 Well plat certified by a registered surveyor.  | 4 Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).    |
| 2 A Drilling Plan.   | 5 Operator certification  |
| 3 A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6 Such other site specific information and/or plans as may be required by the authorized officer. |

25 Signature 	Name (Printed/Typed) <b>Kelly J. Holly</b>	Date <b>08/16/2011</b>
Title <b>Permitting Tech</b>		

Approved by (Signature) <b>/s/ Don Peterson</b>	Name (Printed/Typed) <b>/s/ Don Peterson</b>	Date <b>OCT 25 2011</b>
Title <b>FIELD MANAGER</b>	Office <b>CARLSBAD FIELD OFFICE</b>	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

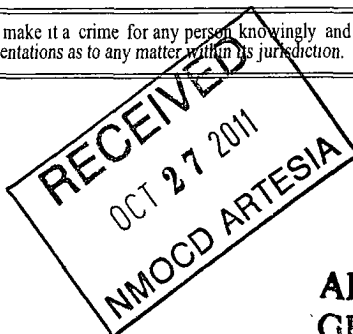
Conditions of approval, if any, are attached.

**APPROVAL FOR TWO YEARS**

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

\*(Instructions on page 2)

ROSWELL CONTROLLED WATER BASIN

SEE ATTACHED FOR  
CONDITIONS OF APPROVALAPPROVAL SUBJECT TO  
GENERAL REQUIREMENTS  
AND SPECIAL STIPULATIONS  
ATTACHED

DISTRICT I  
1625 N FRENCH DR., HOBBS, NM 88240

DISTRICT II  
1301 W. GRAND AVENUE, ARTESIA, NM 88210

DISTRICT III  
1000 RIO BRAZOS RD., AZTEC, NM 87410

DISTRICT IV  
11885 S. ST. FRANCIS DR., SANTA FE, NM 87505

State of New Mexico  
Energy, Minerals & Natural Resources Department  
**OIL CONSERVATION DIVISION**  
1220 South St. Francis Dr.  
Santa Fe, New Mexico 87505

Form C-102  
Revised July 16, 2010  
Submit to Appropriate  
District Office

☐ AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

API Number 30-015 - <b>39570</b>	Pool Code 28509	Pool Name Grayburg Jackson; SR-Q-G-SA
Property Code 308086	Property Name <b>BURCH KEELY UNIT</b>	Well Number 643
OGRID No. 229137	Operator Name <b>COG OPERATING, LLC</b>	Elevation 3626'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	19	17-S	30-E		2120	NORTH	2310	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 40	Joint or Infill	Consolidation Code	Order No						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

**RECEIVED**  
OCT/27 2011  
NMOCD ARTESIA

**OPERATOR CERTIFICATION**

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

*Kelly J. Holly* 8-16-11  
Signature Date  
Kelly J. Holly  
Printed Name  
kholly@concho.com  
E-mail Address

**SURVEYOR CERTIFICATION**

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

JULY 27, 2011

Date of Survey  
Signature & Seal of Professional Surveyor:  
*Ronald J. Eidson*  
Certificate Number Gary G. Eidson 12641  
Ronald J. Eidson 3239  
LA WSC W.O. 11.11.1038

## MASTER DRILLING PROGRAM

### 1. Geologic Name of Surface Formation

Quaternary

### 2. Estimated Tops of Important Geologic Markers:

Quaternary	Surface
Rustler	250'
Salt	360'
Base of Salt	780'
Yates	1080'
Seven Rivers	1370'
Queen	1985'
Grayburg	2380'
San Andres	2715'
Glorieta	4110'
Paddock	4185'
Blinbry	4730'
Tubb	5700'

### 3. Estimated Depths of Anticipated Fresh Water, Oil and Gas

Water Sand	150'	Fresh Water
Grayburg	2380'	Oil/Gas
San Andres	2715'	Oil/Gas
Glorieta	4110'	Oil/Gas
Paddock	4185'	Oil/Gas
Blinebry	4730'	Oil/Gas
Tubb	5700'	Oil/Gas

See COA  
No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 300' and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 8 5/8" casing to 830' and circulating cement, in a single or multi-stage job and/or with an ECP, back to the surface. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them. This will be achieved by cementing, with a single or multi-stage job, the 5 1/2" production casing back 200' into the intermediate casing, to be run at TD. If wellbore conditions arise that require immediate action and/or a change to this program, COG Operating LLC personnel will always react to protect the wellbore and/or the environment. See COA

#### 4. Casing Program

Hole Size	Interval	OD Casing	Weight	Grade	Jt., Condition	Jt.	brst/clps/ten
17 1/2"	0-300'	13 3/8"	48#	H-40orJ-55	ST&C/New	ST&C	9.22/3.943/15.8
11" or 12 1/4"	0-850' / 200'	8 5/8"	24or32#	J-55	ST&C/New	ST&C	3.03/2.029/7.82
7 7/8"	0-TD	5 1/2"	15.5or17#	J-55orL-80	LT&C/New	LT&C	1.88/1.731/2.42

#### 5. Cement Program

13 3/8" Surface Casing:

Class C w/ 2% CaCl<sub>2</sub> + 0.25 pps CF, 400 sx, yield 1.32, back to surface. 154% excess

8 5/8" Intermediate Casing:

##### 11" Hole:

**Single Stage:** 50:50:10 C:Poz:Gel w/ 5% Salt + 0.25% CF, 300 sx lead, yield-2.45 + Class C w/2% CaCl<sub>2</sub>, 200 sx tail, yield-1.32, back to surface. 363% excess

**Multi-Stage:** Stage 1: Class C w/2% CaCl<sub>2</sub>, 200 sx, yield - 1.32; 108% excess  
Stage 2: 50:50:10 C:Poz:Gel w/ 5% Salt + 0.25% CF, 300 sx, yield - 2.45, back to surface, 726% excess; assumption for tool is lost circulation. Multi stage tool to be set at approximately, depending on hole conditions, 350' (50' below the surface casing). Cement volumes will be adjusted proportionately for depth changes of multi stage tool.

5 1/2" Production Casing:

**Single Stage:** LEAD 500 sx 35:65:6 C:Poz:Gel w/ 5% Salt + 5 pps LCM + 0.2% SMS + 0.3% FL-52A + 0.125 pps CF, yield-2.05; + TAIL 400 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield-1.37, to 200' minimum tie back to intermediate casing. 106% open hole excess, cement calculated back to surface.

**Multi-Stage:** Stage 1: (Assumed TD of 4800') 500 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 +

1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield - 1.37, 72% excess; Stage 2: LEAD 450 sx 50:50:2 C:Poz:Gel w/ 5% Salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.3% FL-52A + 0.125 pps CF, yield - 1.37, + TAIL 250 sx Class C w/ 0.3% R-3 + 1.5% CD-32, yield - 1.02 148% open hole excess, cement calculated back to surface. Multi stage tool to be set at approximately, depending on hole conditions, 2500'. Cement volumes will be adjusted proportionately for depth changes of multi stage tool, assumption for tool is water flow.

## 6. Minimum Specifications for Pressure Control

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer, and in some cases possibly a 2000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top of 4 1/2" drill pipe rams on the bottom. A 13-5/8" or 11" BOP will be used, depending on the rig selected, during the drilling of the well. The BOP will be nipped up on the 13 3/8" surface casing with BOP equipment and tested to 2000 psi. When 11" BOP is used the special drilling flange will be utilized on the 13-3/8" head to allow testing the BOP with a retrievable test plug. After setting 8-5/8" the BOP will then be nipped up on the 8 5/8" intermediate casing and tested by a third party to 2000 psi and used continuously until total depth is reached. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment (Exhibit #10) will include a Kelly cock and floor safety valve, choke lines and a choke manifold (Exhibit #11) with a 2000 psi WP rating.

The majority of the rigs currently in use have a 13-5/8" BOP, so no special provision is needed for most wells in the area for conventionally testing the BOP with a test plug. However, due to the vagaries of rig scheduling, it might be that one of the few rigs with 11" BOP's might be called upon to drill any specific well in the area. Note that intermediate hole size is always 11". Therefore, COG Operating LLC respectfully requests a variance to the requirement of 13-5/8" BOP on 13-3/8" casing. When that circumstance is encountered the special flange will be utilized to allow testing the entire BOP with a test plug, without subjecting the casing to test pressure. The special flange also allows the return to full-open capability if desired.

See COA  
1

**7. Types and Characteristics of the Proposed Mud System**

The well will be drilled to TD with a combination of brine, cut brine and polymer mud system. The applicable depths and properties of this system are as follows:

DEPTH	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-300'	Fresh Water	8.5	28	N.C.
300- <del>850'</del> 1200'	Brine	10	30	N.C.
850'-TD	Cut Brine	8.7-9.1	29	N.C.

Sufficient mud materials will be kept at the well site to maintain mud properties and meet minimum lost circulation and weight increase requirements at all times.

**8. Auxiliary Well Control and Monitoring Equipment**

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

**9. Logging, Testing and Coring Program** *See CORA*

- A. The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log and will be run from TD to 8 5/8" casing shoe.
- B. Drill Stem test is not anticipated.
- C. No conventional coring is anticipated.
- D. Further testing procedures will be determined after the 5 1/2" production casing has been cemented at TD, based on drill shows and log evaluation.

**10. Abnormal Conditions, Pressure, Temperatures and Potential Hazards**

No abnormal pressures or temperatures are anticipated. The estimated bottom hole at TD is 110 degrees and the estimated maximum bottom hold pressure is 2300 psig. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, although a Hydrogen Sulfide Drilling Operation Plan is attached to this program. No major loss of circulation zones has been reported in offsetting wells.

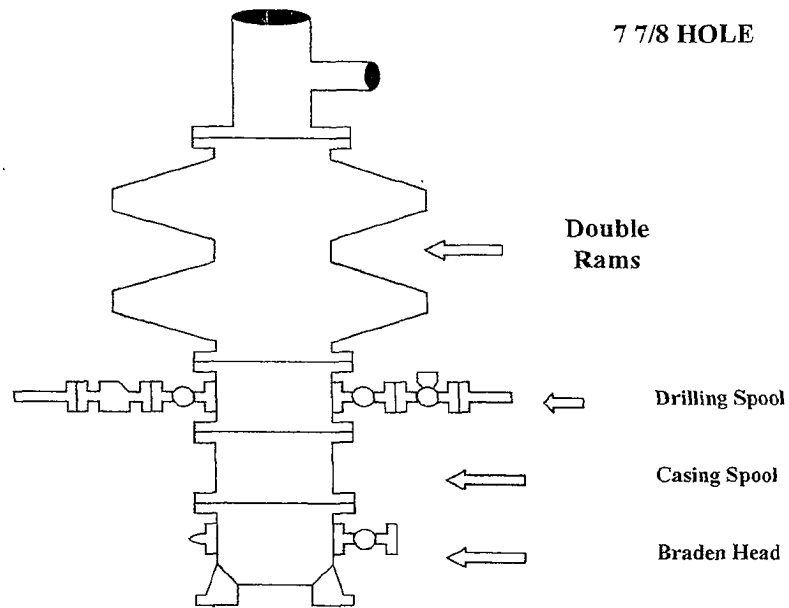
**11. Anticipated Starting Date and Duration of Operations**

Road and location work will not begin until approval has been received from the BLM. As this is a Master Drilling plan, please refer to the Form 3160-3 for the anticipated start date. Once commenced, drilling operations should be finished in approximately 12 days. If the well is productive, an additional 30 days will be required for completion and testing before a decision is made to install permanent facilities.

# COG Operating LLC

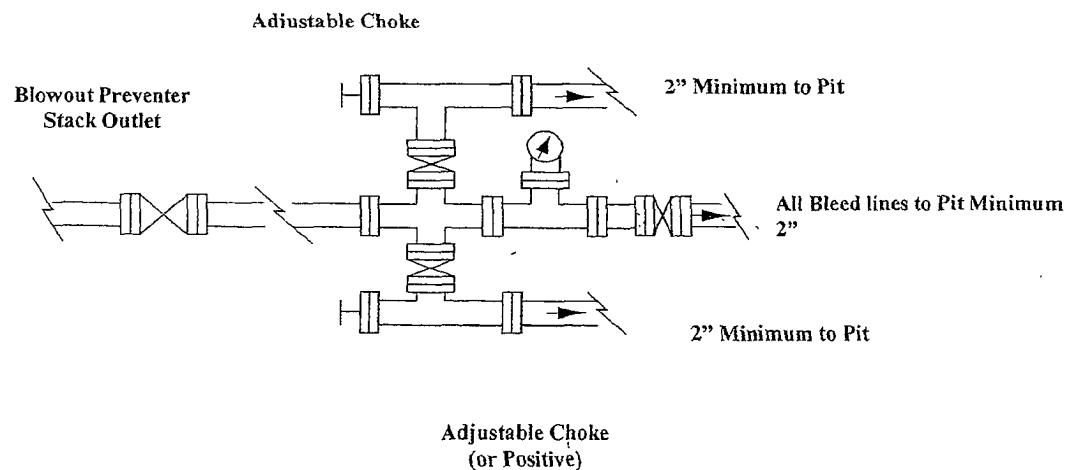
## Exhibit #9

### BOPE and Choke Schematic



Minimum 4" Nominal choke and kill lines

Choke Manifold Requirement (2000 psi WP)  
No Annular Required





**NOTES REGARDING THE BLOWOUT PREVENTERS**  
**Master Drilling Plan**  
**Eddy County, New Mexico**

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

DISTRICT 2 -- CHECKLIST FOR INTENTS TO DRILL

Operator COE Op2 OGRID # 229134  
 Well Name & # BURCH KEELEY 643 Surface Type (F)(S) (P)  
 Location: UL F Sect 19 Township 17 s, RNG 30 e, Sub-surface Type (F)(S) (P)

A. Date C101 rec'd 10/27/2011 C101 reviewed 10/28/2011

B. 1. Check mark, Information is OK on Forms:

OGRID ✓, BONDING ✓, PROP CODE ✓, WELL # 3042 SIGNATURE ✓

2. Inactive Well list as of: 10/28/2011 # wells 3042 # Inactive wells 8

a. District Grant APD but see number of inactive wells:

No letter required ✓; Sent Letter to Operator       , to Santa Fe       

3. Additional Bonding as of: 10/28/2011

a. District Denial because operator needs addition bonding:

No Letter required ✓; Sent Letter to Operator       , To Santa Fe       

b. District Denial because of Inactive well list and Financial Assurance:

No Letter required ✓; Sent Letter to Operator       , To Santa Fe       

C. C102 YES ✓ NO       , Signature ✓

1. Pool GRAYBURG JACKSON, Code 28509

a. Dedicated acreage 40, What Units F

b. SUR. Location Standard ✓: Non-Standard Location       

c. Well shares acres: Yes ✓ No       , # of wells        plus this well #       

2. 2<sup>nd</sup>. Operator in same acreage, Yes       , No       

Agreement Letter       , Disagreement letter       

3. Intent to Directional Drill Yes       , No       

a. Dedicated acreage       , What Units       

b. Bottomhole Location Standard       , Non-Standard Bottomhole       

4. Downhole Commingle: Yes       , No       

a. Pool #2       , Code       , Acres       

Pool #3       , Code       , Acres       

Pool #4       , Code       , Acres       

5. POTASH Area Yes       , No       

D. Blowout Preventer Yes ✓, No       

E. H2S Yes ✓, No       

F. C144 Pit Registration Yes       , No       

G. Does APD require Santa Fe Approval:

1. Non-Standard Location: Yes       , No ✓, NSL #       

2. Non-Standard Proration: Yes       , No ✓, NSP #       

3. Simultaneous Dedication: Yes       , No ✓, SD #       

Number of wells        Plus #       

4. Injection order Yes       , No ✓; PMX #        or WFX #       

5. SWD order Yes       , NO ✓; SWD #       

6. DHC from SF       ; DHC-HOB       ; Holding       

7. OCD Approval Date 10/28/2011

API #30-0 15-39570

8. Reviewers TCS